SECTION 12 26 00
OPTICAL SIDE-DAYLIGHTING SYSTEM

PART 1 - GENERAL

1.01 SCOPE

A. Furnish and install optical side-daylighting system

1.02 RELATED SECTIONS

A. Section 08 51 13 – Aluminum Windows

B. Section 08 41 13 – Glazed Aluminum Framed Entrances and Storefronts

C. Section 08 44 13 – Glazed Aluminum Curtain Walls

D. Section 26 08 00 – Commissioning of Electrical Systems

E. Section 26 09 19 – Lighting Controls

F. Section 26 09 36 – Modular Dimming Controls

G. Section 26 09 43 – Network Lighting Control

1.03 SYSTEM DESCRIPTION

A. An optical side-daylighting system is a passive, optical daylighting device, which sits inboard in the “daylight” window, and intercepts and redirects incident daylight uniformly onto the ceiling of the daylit space. Its optical design has been optimized so that all direct sunlight above a 5-degree solar altitude angle will be intercepted and redirected upward onto the ceiling, thus increasing the daylit area while eliminating any direct sunlight from striking a work surface. When integrated with daylight dimming controls on the electric lighting system serving the daylit space, the optical side-daylighting system can save a significant amount of energy and energy costs.

1.04 PERFORMANCE REQUIREMENTS

A. The reflecting slats of the optical side-daylighting system shall have, at a minimum, the following optical properties:

1. Reflective Surfaces:
   a. Total Reflectance (Nominal) -- 85%
   b. Direct Image Reflectance, Specularity (Nominal) -- 84%
2. Non-Reflective Surfaces:
   a. Total Reflectance (Nominal) -- Less than 40%
   b. Direct Image Reflectance, Specularity (Nominal) -- Less than 5%.

B. Optical design / geometry of the reflective slat shall be such that all direct sunlight above a 5-degree solar altitude angle striking the slat shall be redirected in an upward direction.

C. The reflective slat film shall be durable and ultra-violet light stable, and shall not peel or discolor.

D. The reflecting slats of an optical side-daylighting unit shall not have an offset from level of more than 0.125 inch over the length (span) of the slat.

E. The optical side-daylighting unit shall securely attach to the window frame so that seismic or other forces will not dislodge the unit, causing it to fall.

F. The optical side-daylighting unit shall pivot into the room, without the potential to become dislodged, so that the window glass behind the daylighting unit can be cleaned.

G. The optical side-daylighting unit shall be removable with minimum potential for damage.

H. It shall be possible to replace the optical reflective slats. This may require the removal of the unit from “daylight” window, and disassembling of the optical side-daylighting unit.

1.05 PRODUCT SCHEDULE

A. Location of optical daylighting units are designated on the architectural finish schedule in the Specifications and shown in the architectural drawings at some locations.

1.06 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Product Data: Provide data indicating physical and dimensional characteristics and operating features, photometric properties of the reflective slats, and other data substantiating that the Performance Requirements of Section 1.04 have been met.

C. Shop Drawings: Indicate opening sizes, tolerances required, methods of assembly and attachment, clearances, and operation.

D. Manufacturer's Installation Instructions: Indicate any special procedures.

E. Manufacturer’s Maintenance Instructions.

1.07 QUALITY ASSURANCE

A. The supplier of the optical side-daylighting system shall prepare shop drawings and specifications to substantiate that the Performance Requirements specified in Section 1.04 have been met, and inform the general contractor and / or the installing subcontractor of the required installation procedures.

1.08 PROJECT CONDITIONS

A. Coordinate the work with window blind / shade installation, or whatever trade will install the optical side-daylighting units.

B. Field measurements of the “daylight” windows (window openings receiving the optical side-daylighting units) shall be made to determine sizes of optical side-daylighting units required. Measurements from construction documents or shop drawings can be used to determine sizes of optical side-daylighting units required if final installed tolerances can be ensured.

1.09 DELIVERY, STORAGE AND HANDLING

A. Deliver optical side-daylighting units packaged in a manner to prevent damage to components or marring of surfaces.

B. Store in a clean, dry area. Store in a manner recommended by the manufacturer to avoid damage.

PART 2 - PRODUCTS

2.01 **ACCEPTABLE MANUFACTURER**

A. LightLouver LLC

LightLouver LLC is the only known source for the specified Optical Side- Daylighting System meeting the Performance Requirements in Section 1.04. Their address and contact information are as follows: LightLouver LLC, 685 South Arthur Avenue, Louisville, Colorado 80027, telephone (303) 444 8773, fax (866) 929 8991, and e-mail info@lightlouver.com.

2.02 OPTICAL DAYLIGHTING UNIT COMPONENTS

A. Reflective Slats: Horizontal reflective slats, with the optical and physical properties specified in Section 1.04, and formed into an optical geometric shape designed to achieve the daylighting and solar control functions specified in Section 1.04.

B. Reflective Surfaces: Reflective surfaces of the optical slats shall consist of a heat applied reflective film with an appropriate pressure sensitive adhesive which meets the optical and physical performance properties specified in Section 1.04.

C. Unit Support: Integrated support system shall include a horizontal unit support bar at the top of the unit that connects to vertical support rods which support the reflective slats and that engages specially designed support brackets that are fastened to the window frame.

D. Accessory Hardware: All accessory hardware, such as light-blocking elements and unit glazing stand-offs, shall be provided with the

optical side-daylighting units, with no substitutions allowed.

2.03 FABRICATION

A. Fabricate optical side-daylighting units to fit within “daylight” window openings with uniform side edge clearance of 3/8 inch +/- 1/8 inch. Top and bottom edge clearance may vary due to size of window specified by the architect. Variation in the “daylight” window finished opening dimensions may result in larger tolerances to minimize the number of different unit types fabricated.

B. Fabricate optical side-daylighting units to easily install into the “daylight” window openings without damaging the daylighting unit or the surrounding window frame. Variation in the “daylight” window finished opening dimensions may result in larger tolerances to minimize the number of different unit types fabricated.

2.04 REPLACEMENT PARTS

A. Replacement optical side-daylighting units shall be fabricated in the following quantities: 5% of the total number of units.

B. All replacement optical side-daylighting units shall be properly protected, remain in their original packaging materials, and properly labeled by unit type.

C. The packaged replacement optical side-daylighting units shall be delivered to the building O+M staff just prior to occupancy.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that “daylight” window openings are ready to receive the optical side-daylighting units.

3.02 INSTALLATION

A. Install the optical side-daylighting units in accordance with manufacturer’s instructions and procedures. To avoid damage and accumulation of dust and debris on the surfaces of the reflecting slats, install the optical side-daylighting system just prior to building turnover to the owner and when all final cleaning and air handling equipment filter changes have occurred.

B. Install proper optical side-daylighting unit type in the “daylight” window.

C. Field apply the light-blocking seals as required in accordance with the manufacturer’s instructions and procedures.

D. As required, clean reflective surfaces of the slats to remove any dust, smudges or fingerprints following the manufacturer's instructions for cleaning and handling.

E. Leave work area clean and free of debris.

3.03 INSTALLATION TOLERANCES

A. Maximum Variation of Gap at Window Opening Perimeter: side edge -- 3/8 (0.375) inch. Top / bottom edge -- varies based on "daylight" window sizing. Variation in the "daylight" window finished opening dimensions may result in larger tolerances to minimize the number of different unit types fabricated.

B. Maximum Offset From Level: 0.0625 inch.

3.04 CLEANING

A. As required, clean optical side-daylighting unit slat reflective surfaces just prior to occupancy, following the manufacturer's instructions for cleaning and handling.

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Deleted Sample schedule